PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Takuya Tsukagoshi
Application No.	:	10/796,394
Filed	:	March 9, 2004
For	:	HOLOGRAPHIC RECORDING AND REPRODUCING APPARATUS

Examiner	:	Arnel C. Lavarias
Art Unit	:	2872
Docket No.	:	890050.468
Date	:	August 13, 2007

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF

Commissioner for Patents:

This brief is in furtherance of the Notice of Appeal, filed in this case on June 13, 2007. The fees required under Section 1.17(c), and any required request for extension of time for filing this brief and fees therefor, are dealt with in the accompanying transmittal letter.

I. REAL PARTY IN INTEREST

TDK Corporation is the assignee of the present application and is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

Claims 1-3 are pending and were rejected. Claims 4-6 have been cancelled. Claims 1-3 are being appealed.

IV. STATUS OF AMENDMENTS

An amendment has been filed on July 25, 2007 removing language from claim 1 which the Examiner rejected under 35 U.S.C. § 112, first paragraph, as not in compliance with the written description requirement in a final Office Action mailed on March 13, 2007. The removal of the language from claim 1 merely removes from the claim that language which the Examiner stated had no support in the specification and returns the claim to the language in the amendment filed on September 11, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

FIG.3

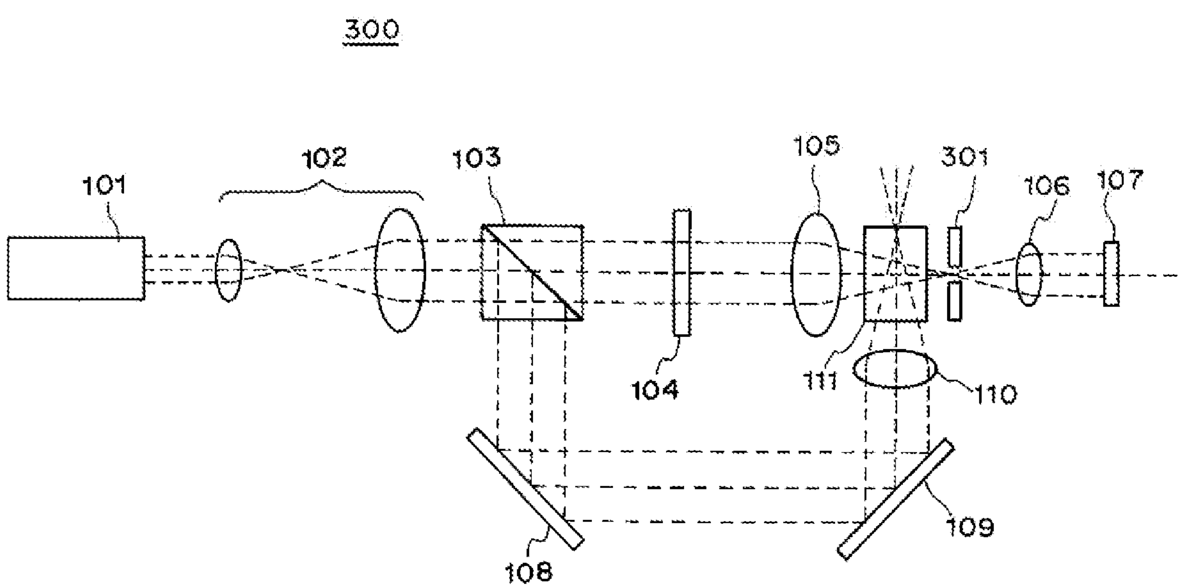
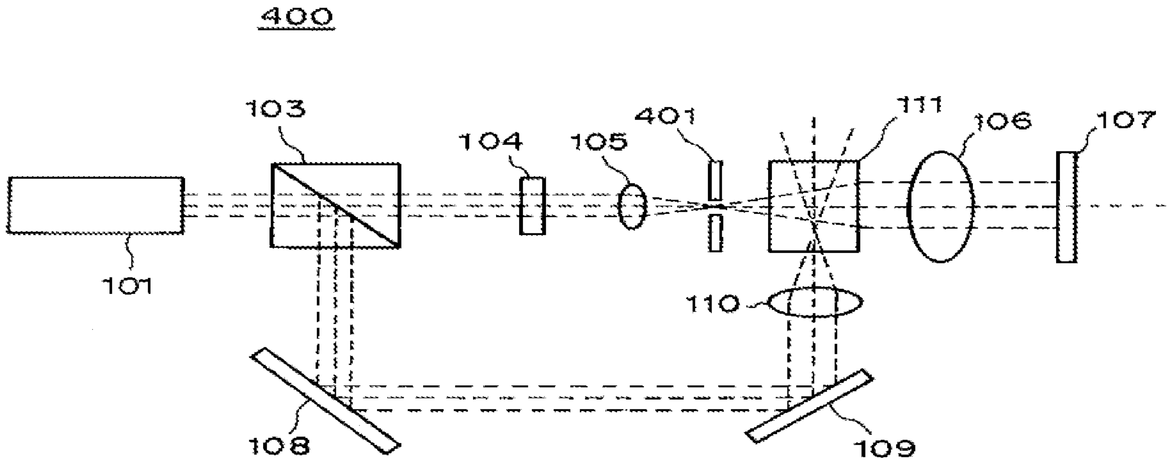


FIG.4



One embodiment of Applicant's invention is directed to a holographic recording and reproducing apparatus 300, 400 for recording data as phase information of light in a holographic recording medium 111 by projecting a signal beam and a reference beam onto the holographic recording medium 111. A pinhole 301, 401 is disposed at a confocal point of a Fourier transform lens 105 and a reverse Fourier transform lens 106, such that the pinhole 301, 401 is disposed either between the holographic recording medium 111 and the Fourier transform lens 105 or between the holographic recording medium 111 and the reverse Fourier transform lens 106. The focal length of the Fourier transform lens 105 remains unchanged and the pinhole 301, 401 is disposed at the confocal point of the Fourier transform lens 105 and the reverse Fourier transform 106 so as to serve as a spatial filter to the holographic recording and reproducing apparatus 300, 400 and remove a noise component when data are recorded or data are reproduced. *See, e.g.,* Figures 3 and 4 reproduces herein. as filed.

The use of the holographic recording and reproducing apparatus 300, 400 is advantageous over a conventional optical system in that it can be made compact even when devices having large sizes and low resolution are incorporated therein (*e.g.*, a spatial light modulator 104 and a CCD image sensor 107). *See, e.g.*, page 4, lines 5-9 and page 14, lines 10-14 of the present application.

According to one embodiment of the holographic reproducing apparatus 300, 400, the focal length of the Fourier transform lens 105 is set longer than that of the reverse Fourier transform lens 106, thereby shortening an optical path length. Such configuration allows for the CCD image sensor 107 to have a smaller size and higher resolution than the spatial light modulator 104, thus reducing the size of the holographic reproducing apparatus 300. (*See, e.g.*, page 4, lines 26-27, page 5, lines 1-8, page 9, lines 4-27 and page 10, lines 1-19) According to another embodiment of the holographic recording and reproducing apparatus 300, 400, the focal length of the reverse Fourier transform 106 is set longer than that of the Fourier transform lens 105, thereby shortening the optical path. Such configuration allows for the spatial light modulator 104 to have a smaller size and higher resolution than the CCD image sensor 107, thus reducing the size of the holographic recording apparatus 400. *See, e.g.*, page 5, lines 9-18, page10, lines 20-27, page11, line 1- page 12, line 5 of the present application.

Since the holographic recording and reproducing apparatus 300, 400 allows for the CCD image sensor 107 to have a smaller size and higher resolution for reproducing images and for the spatial light modulator 104 to have a smaller size and higher resolution for recording images, deficiencies of the conventional optical system are addressed wherein a spatial light modulator and a CCD image sensor restrict the resolution of a light sensitive material (holographic recording medium) thus causing a large beam diameter, which results in the use of large lenses and a longer optical path length. *See, e.g.*, page 3, lines 22-27 and page 4, lines 1-2 of the present application.

The following discusses independent claim 1 and dependent claims 2-3 with reference numbers indicating those claim elements being read on the embodiments disclosed in the specification and figures. Furthermore, the information in parenthesis provide specific page, line numbers, and drawing references to example embodiments corresponding to the elements recited in the claims. Of course, the reference numbers and parenthetical information are exemplary only and are not intended to limit the claims only to the exact embodiments shown and described in the specification and figures.

1. A holographic recording and reproducing apparatus **(300 in Figure 3 and 400 in Figure 4)** for recording data as phase information of light in a holographic recording

medium **(111 in Figures 3 and 4)** by projecting a signal beam and a reference beam thereonto **(page 8, lines 25-27 and page 9, lines 1-3)**, the holographic recording and reproducing apparatus comprising at least a spatial light modulator **(104 in Figures 3 and 4)**, a Fourier transform lens **(105 in Figures 3 and 4)**, a reverse Fourier transform lens **(106 in Figures 3 and 4)**, a Charge Coupled Device (CCD) image sensor **(107 in Figures 3 and 4)** and a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens **(301 in Figure 3; 401 in Figure 4; page 12, lines 11-20)**, the holographic recording medium being disposed between the Fourier transform lens and the reverse Fourier transform lens **(page 4, lines 16-18; page 7, lines 6-7; page 13, lines 25-27; Figures 3-4)**, and the focal length of the Fourier transform lens and focal length of the reverse Fourier transform lens being different from each other **(page 14, lines 2-3; Figures 3-4)** and remain unchanged, and the pinhole being disposed between the holographic recording medium and the Fourier transform lens **(Figure 4; page 12, line 24 - page 13, line 3)** or between the holographic recording medium and the reverse Fourier transform lens **(Figure 3; page 12, lines 9-15)**.

2. A holographic recording and reproducing apparatus in accordance with Claim 1, wherein the focal length of the Fourier transform lens is set to be longer than that of the reverse Fourier transform lens **(Figure 3; page 4, line 26 – page 5, line 1; page 9, lines 20-22)**.

3. A holographic recording and reproducing apparatus in accordance with Claim 1, wherein the focal length of the reverse Fourier transform lens is set to be longer than that of the Fourier transform lens **(Figure 4; page 5, lines 9-11; page 10, lines 11-16)**.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou et al., hereinafter Chou, (W. Chou, M.A. Neifeld, 'Interleaving and error correction in volume holographic memory systems', Appl. Opt., vol. 37, no. 29, October 10, 1998, pp. 6951-6968) in view of Curtis et al., hereinafter Curtis, (U.S. Patent No. 6,163,391) and Bernal et al, hereinafter Bernal, (M.P. Bernal, G.W. Burr, H. Coufal, M. Quintanilla, 'Noise in high-areal-

density holographic data storage systems', Opt. Soc. America, Washington D.C., USA, May 1998, pp.21-22).

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou in view of Curtis and Bernal.

Claims 1-2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou, in view of Tanaka et al U.S. Patent No. 6,301,028 (hereinafter "Tanaka") and Bernal.

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou, in view of Tanaka and Bernal.

VII. ARGUMENT

A. Section 103 rejections on the basis of Chou in view of Curtis and Bernal

1. Claims 1-3

a) Chou, Curtis and Bernal, whether alone or in combination, do not teach or suggest the invention recited in claim 1.

Chou, Curtis and Bernal, whether alone or in combination, do not teach or suggest the invention recited in claim 1. In particular, claim 1 recites "…the holographic recording and reproducing apparatus comprising at least a spatial light modulator, a Fourier transform lens, a reverse Fourier transform lens, a Charge Coupled Device (CCD) image sensor and *a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens…the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens*." (Emphasis added.)

Chou fails to teach a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens, and the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens, as recited in claim 1. Chou makes no mention whatsoever of a pinhole and instead teaches a storage medium recording an interference

pattern between object and reference beams at a confocal point of lens 1 and lens 2 (Figure 1). Furthermore, the Examiner has acknowledged, on page 4 of a final Office Action dated April 10, 2006, that Chou fails to disclose "a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens."

Curtis and Bernal, whether alone or in combination, fail to cure the deficiencies of Chou. In particular, Curtis does not teach or suggest a pinhole. Instead, Curtis teaches a holographic recording apparatus including a transforming lens 390 or a power element 405 that adds convergence or divergence, respectively, to an object beam before the object beam enters the Fourier transform lens. The transforming lens 390 or the power element 405 is disposed in the path of the object beam at a position prior to the Fourier transform lens 390, thereby repositioning the dc focus 380 (focal point) either behind a Fourier transform plane 385 (if the diverging power element 405 is used) or in front of the Fourier transform plane 385 (if the converging transform lens 390 is used) (See figures 10-11 and column 11, lines 1-20 of Curtis).

The Examiner contended on page 2 of an Advisory Action, dated July 24, 2006, that "Curtis et al. is being relied upon to evidence the repositioning of the focal point of the Fourier transform lens away from the recording medium, such that the focal point now must be located either between the Fourier transform lens and recording medium, or between the recording medium and inverse Fourier transform lens."

To supply the missing teachings of Chou and Curtis in order to reject claim 1, the Examiner has cited Bernal as teaching an aperture placed at a Fourier plane. However, Bernal fails to cure the deficiencies of both Chou and Curtis. Claim 1 is specific in that the pinhole is disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens. Bernal discloses a holographic recording and reproducing apparatus including a spatial light modulator SLM, CCD image sensor, two Fourier lenses L1, L2, a holographic recording material and an aperture D (Figure 1). Bernal states that "the holographic recording material is placed at the Fourier plane of the 4f configuration," the holographic recording material being disposed at the Fourier plane located at a center position between L1 and L2. Bernal further states that "it is useful to place an aperture at the Fourier plane." Thus, the aperture D corresponding to the pinhole may also be disposed at the Fourier plane. Applicant therefore construes Bernal as teaching that *either* the

holographic recording material *or* the aperture is disposed at the Fourier plane. Consequently, the aperture of Bernal is not disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens, as recited in claim 1.

Thus, Chou, Curtis and Bernal, taken alone or in combination fail to teach all the limitations of independent claim 1, in particular, "the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens."

b) Examiner's asserted modification of Chou to incorporate limitations of Curtis and Bernal renders the system of Chou inoperable

The Examiner has argued that it would have been obvious to modify the 4*f* optical system of Chou to incorporate specific portions of the teachings of Curtis and Bernal. More specifically, the Examiner contends that the holographic recording medium of Curtis - which is positioned away from the focal point of the incident Fourier transform lens – and the aperture of Bernal – which is disposed at the Fourier plane located at the confocal point D of lenses L1 and L2 - may be combined to modify the optical system of Chou. The Examiner asserts that such modifications to the teachings of Chou would result in the invention recited in claim 1.

The applicant respectfully disagrees with such assertion. The Examiner's proposed changes to the optical system of Chou would render Chou's system unsatisfactory for its intended purpose. As stated in MPEP 2143.01(V), "If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

Chou provides the *4f* optical system for the purpose of studying the use of error-correction coding (ECC) and two-dimensional (2D) interleaving for volume holographic memory (VHM) systems suffering from both random and systematic errors. The bit-error rate (BER) is used as the data-fidelity measure and as a design metric for the optical *4f* system. The *4f* optical system is a typical holographic storage system architecture implemented to demonstrate a methodology of using ECC and interleaving in a VHM system and analyzing the effects of such

methodology on data. To fulfill the intended purpose of Chou's optical system, a single random noise source is combined with various systematic error sources. *See e.g.*, pages 6951-6953. It is therefore an important element of Chou that random noise is actually present in the VHM system, so as to allow for an analysis of the effect of the noise on the data when the ECC methodology is being used.

In the face of this teaching of Chou there is no reason whatsoever why a person skilled in the art would attempt to place the aperture of Bernal – which is disposed at the Fourier plane located at the confocal point D of lenses L1 and L2 - at the confocal point of lens 1 and lens 2, which would simply remove the noise component from data being transmitted within the VHM system. In fact, if such a modification was implemented the system of Chou would not accomplish the goal of demonstrating the methodology of ECC and interleaving in a VHM system, and analyzing the effects of such methodology on the data.

Thus, the proposed changes set forth by the Examiner would render the system of Chou inoperable for its intended purpose.

c) Examiner's asserted combination of Chou, Curtis and Bernal fails to consider the references in their entirety

The Examiner *must* take the references in their entirety, and cannot simply ignore portions that *teach away* from the claimed subject matter or otherwise argue against obviousness. *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 230 U.S.P.Q. 416, 420 (Fed. Cir. 1986). It is impermissible to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Id* at 419. The courts have long cautioned that consideration *must* be given "where the references diverge and *teach away* from the claimed invention." *Akzo N.V. v. International Trade Commission*, 1 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1986). In other words, the Examiner has not explained why one skilled in the art would ignore the clear and unambiguous teachings of Bernal, that *either* the holographic recording material *or* the aperture is disposed at the Fourier plane, and instead the Examiner has tried to fit this incompatible/inconsistent teaching of Bernal with Chou and Curtis to teach a pinhole disposed between the *holographic recording medium* and the Fourier transform lens or between the *holographic recording medium* and the reverse Fourier transform lens, as recited in claim 1.

For at least the foregoing reasons, claim 1 is nonobvious in view of Chou, Curtis and Bernal as are claims 2-3, which depend therefrom.

B. Section 103 rejections on the basis of Chou in view of Tanaka and Bernal

2. Claims 1-3

a) Chou, Tanaka and Bernal, whether alone or in combination, do not teach or suggest the invention recited in claim 1.

As discussed above, Chou fails to teach a pinhole being disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens, and the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens, as recited in claim 1. Chou makes no mention whatsoever of a pinhole and instead teaches a storage medium recording an interference pattern between object and reference beams at a confocal point of lens 1 and lens 2 (Figure 1).

Tanaka and Bernal, alone or in combination, fail to cure the deficiencies of Chou. Tanaka does not teach or suggest <u>a pinhole disposed at a confocal point</u> of a Fourier transform lens and a reverse Fourier transform lens, and the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens. In particular, Tanaka teaches that the confocal point of the Fourier transform lens 13 and the reverse Fourier transform lens 21 is present in a volume holographic memory 10 and a mask 50 is disposed on a vicinity of a side face of the volume holographic memory 10 and <u>not</u> at the confocal point. *See e.g.*, Figure 2; column 6, lines 18-20. Further, Tanaka illustrates in Figure 9 that the confocal point of the Fourier transform lens 13 and the reverse Fourier transform lens 21 is present on the side of the mask 50. Thus, Tanaka clearly illustrates that the mask 50 is <u>not</u> disposed at the confocal point of the Fourier transform lens 13 and the reverse Fourier transform lens 21. Consequently, Tanaka fails to teach a pinhole disposed at the confocal point of the Fourier transform lens 13 and the reverse Fourier transform lens 21 while the pinhole is disposed between the volume

holographic memory 10 and the Fourier transform lens 13 or between the volume holographic memory 10 and the reverse Fourier transform lens 21.

Bernal, whether alone or in combination with Tanaka, fails to cure the deficiencies of Chou. As discussed above, Bernal discloses a holographic recording and reproducing apparatus including a spatial light modulator SLM, CCD image sensor, two Fourier lenses L1, L2, a holographic recording material and an aperture D (Figure 1). Bernal states that "the holographic recording material is placed at the Fourier plane of the 4f configuration," the holographic recording material being disposed at the Fourier plane located at a center position between L1 and L2. Bernal further states that "it is useful to place an aperture at the Fourier plane." Thus, the aperture D corresponding to the pinhole may also be disposed at the Fourier plane. Applicant therefore construes Bernal as teaching that *either* the holographic recording material *or* the aperture is disposed at the Fourier plane. Consequently, the aperture of Bernal is not disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens while also being disposed at the confocal point, as taught in claim 1.

Moreover, claim 1 includes not only the listed features, but also recites a particular arrangement (*e.g.*, structural interrelationship limitation) among the features that is not taught or suggested by Chou, Tanaka and Bernal.

Claim 1 recites for example a structural interrelationship limitation of "a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens…the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens." Neither Chou, Tanaka nor Bernal makes any mention or recognizes such an interrelationship as important. Applicant was the first to recognize the desirability of the claimed interrelationship of a pinhole disposed at a confocal and positioned between a holographic recording medium and a Fourier transform lens or a reverse Fourier transform lens.

There must be evidence that a "skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for <u>combination in the manner claimed</u>." *In re Rouffet,* 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1456 (Fed. Cir. 1998) (emphasis added); *see* also *In re Werner*

Kotzab, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). It is well established that when a rejection for obviousness depends on a combination of elements disclosed in prior art references, the Examiner must establish that the prior art references teach elements and their interrelationship limitations as claimed by an applicant, in order for one having ordinary skill in the art ". . . to look to particular sources of information, to select particular elements, and to combine them in the way they were combined by the inventor." ATD v. Lydall Inc., 159 F.3d 534, 546, 48 U.S.P.Q.2d 1321, 1329 (Fed. Cir. 1998) (emphasis added).

It appears that the Examiner is reading the structural interrelationship limitation of "a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens…the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens" as two separate limitations and not as a single structural interrelationship limitation of the pinhole. Instead, the Examiner appears to be reading the structural interrelationship limitation of the pinhole as a first limitation comprising "a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens " and a second limitation comprising "the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens."

It is respectfully noted that the language of claim 1 is specific in that the pinhole limitation includes the pinhole disposed both at the confocal point and between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens. It is therefore insufficient to show obviousness merely by citing one reference that teaches only "a pinhole disposed at the confocal point" and a second reference that teaches only "a pinhole disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens" without citing a reference teaching the interrelationship therebetween.

Thus, it would be impermissible to cite Bernal for *hypothetically* teaching a pinhole at the confocal point, and Tanaka for *hypothetically* teaching a pinhole disposed between the holographic recording medium and the Fourier transform lens or between the holographic

recording medium and the reverse Fourier transform lens, in order to cure the deficiencies of Chou.

Consequently, Chou, Tanaka and Bernal, whether taken alone or in combination, fail to teach all the limitations of independent claim 1, in particular, "a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens…the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens."

b) Examiner's asserted modification of Chou to incorporate limitation of Tanaka and Bernal renders the system of Chou inoperable

The Examiner has argued that it would have been obvious to modify the *4f* optical system of Chou to incorporate specific portions of the teachings of Tanaka and Bernal. More specifically, the Examiner contends that the holographic recording medium of Tanaka – which is located away from the focal point of the incident Fourier lens – and the aperture of Bernal – which is disposed at the Fourier plane located at the confocal point D of lenses L1 and L2 - may be combined to modify the optical system of Chou. The Examiner asserts that such modifications to the teachings of Chou would result in the invention recited in claim 1.

The applicant respectfully disagrees with such assertion. The Examiner's proposed changes to the optical system of Chou would render Chou's system unsatisfactory for its intended purpose. As stated in MPEP 2143.01(V), "If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

As discussed above, Chou provides the *4f* optical system for the purpose of studying the use of error-correction coding (ECC) and two-dimensional (2D) interleaving for volume holographic memory (VHM) systems suffering from both random and systematic errors. The bit-error rate (BER) is used as the data-fidelity measure and as a design metric for the optical *4f* system. The *4f* optical system is a typical holographic storage system architecture implemented to demonstrate a methodology of using ECC and interleaving in a VHM system and analyzing the effects of such methodology on data. To fulfill the intended purpose of

Chou's optical system, a single random noise source is combined with various systematic error sources. *See e.g.*, pages 6951-6953. It is therefore an important element of Chou that random noise is actually present in the VHM system, so as to allow for an analysis of the effect of the noise on the data when the ECC methodology is being used.

In the face of this teaching of Chou there is no reason whatsoever why a person skilled in the art would attempt to place the aperture of Bernal – which is disposed at the Fourier plane located at the confocal point D of lenses L1 and L2 - at the confocal point of lens 1 and lens 2, which would simply remove the noise component from data being transmitted within the VHM system. In fact, if such a modification was implemented the system of Chou would not accomplish the goal of demonstrating the methodology of ECC and interleaving in a VHM system, and analyzing the effects of such methodology on the data.

Thus, the proposed changes set forth by the Examiner would render the system of Chou inoperable for its intended purpose.

c) Examiner's asserted combination of Chou, Tanaka and Bernal fails to consider the references in their entirety

As also discussed above, The Examiner *must* take the references in their entirety, and cannot simply ignore portions that *teach away* from the claimed subject matter or otherwise argue against obviousness. *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 230 U.S.P.Q. 416, 420 (Fed. Cir. 1986). It is impermissible to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Id* at 419. The courts have long cautioned that consideration *must* be given "where the references diverge and *teach away* from the claimed invention." *Akzo N.V. v. International Trade Commission*, 1 U.S.P.Q.2d 1241, 1246 (Fed. Cir. 1986). In other words, the Examiner has not explained why one skilled in the art would ignore the clear and unambiguous teachings of Bernal, that *either* the holographic recording material *or* the aperture is disposed at the Fourier plane, and instead the Examiner has tried to fit this incompatible/inconsistent teaching of Bernal with Chou and Tanaka to teach a pinhole disposed between the *holographic recording medium* and the Fourier transform lens or between the *holographic recording medium* and the reverse Fourier transform lens, as recited in claim 1.

For at least the foregoing reasons, claim 1 is nonobvious in view of Chou, Tanaka and Bernal as are claims 2-3, which depend therefrom.

Respectfully submitted,
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VIII. CLAIMS APPENDIX

1. A holographic recording and reproducing apparatus for recording data as phase information of light in a holographic recording medium by projecting a signal beam and a reference beam thereonto, the holographic recording and reproducing apparatus comprising at least a spatial light modulator, a Fourier transform lens, a reverse Fourier transform lens, a Charge Coupled Device (CCD) image sensor and a pinhole disposed at a confocal point of the Fourier transform lens and the reverse Fourier transform lens, the holographic recording medium being disposed between the Fourier transform lens and the reverse Fourier transform lens, and the focal length of the Fourier transform lens and focal length of the reverse Fourier transform lens being different from each other and remain unchanged, and the pinhole being disposed between the holographic recording medium and the Fourier transform lens or between the holographic recording medium and the reverse Fourier transform lens.

2. A holographic recording and reproducing apparatus in accordance with Claim 1, wherein the focal length of the Fourier transform lens is set to be longer than that of the reverse Fourier transform lens.

3. A holographic recording and reproducing apparatus in accordance with Claim 1, wherein the focal length of the reverse Fourier transform lens is set to be longer than that of the Fourier transform lens.

IX. EVIDENCE APPENDIX

None.

X. <u>RELATED PROCEEDINGS APPENDIX</u>

None.